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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BRINEY III, WALTER F

ART UNIT	PAPER NUMBER
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2615

DATE MAILED: 10/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/016,778	Applicant(s) KARNAD, RAVINDRA	
	Examiner Walter F. Briney III	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 8-12, 18-22 and 24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 13-17 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01 August 2006 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. **Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Claims 1-7 recite "optimized to implement high fidelity speech transmit and receiving functions." The relative term "high fidelity" has no absolute plain meaning and is not elucidated in the specification. Therefore, the metes and bounds of this limitation cannot be determined. As such, this limitation is interpreted as non-limiting.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2615

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Carter et al. (US Patent 5,138,658).**

Claim 1 is limited to “a subscriber device for transmitting voice frequencies including a telephonic device and a subscriber loop interface circuit (SLIC).” Likewise, Carter discloses both a “SLIC” 32 and “telephone device” 14 forming a “subscriber device.” See figure 1. The SLIC is for connection to a central office 12 and makes up a remote terminal. The claim limitation “for connection to a remote central office (CO)” is an intended use and does not imply any specific structure for the SLIC beyond the inclusion of signaling inputs and outputs for communication with a remote CO. Figures 1 and 2, which more fully depicts the SLIC, clearly show that the SLIC includes central office interfaces 18, 30, 40, 46, 48 and 50. While the resistance of the “telephone device” 14 is not disclosed, the operating current is: at least 20 mA. See column 1, lines 34-42. The resistance of the telephone will be discussed in more detail below. As seen in figure 1, the SLIC is “incorporated in proximity” to the remainder of the subscriber device (i.e. telephone device and SLIC), “relative to said CO.”

With further respect to the claimed SLIC, it is noted that Carter discloses an “AC current source” 42 and 44 that “synthesizes a desired impedance termination” with the assistance of balance resistor 43 and one primary coil winding of transformer 38. The current source also provides “speech transmit and receiving functions.” See column 5, lines 50-59. The claimed phrase “optimized to” is akin to the phrase “adapted for” and

is specifically treated in accordance with MPEP § 2106(II)(C). In particular, the optimization of the AC current source is not limiting since the plain meaning of the "optimized to" clause uses relative language, e.g. "high fidelity," and these terms are not defined in the specification in a manner that enables one of ordinary skill in the art to determine the metes and bounds of the claim. See the preceding 35 U.S.C. 112, second paragraph, rejection of claim 1.

Moreover, the SLIC of Carter includes a "DC current source" including elements 38, 52, 54, 56, 58 and negative power rail $-V$. Element 52 ensures a "switched mode constant DC current" is applied, in parallel with the AC transmit current, to the tip and ring lines supplying telephone device 14. See column 5, line 60, through column 6, line 45. The presence of inductor 106 and the secondary coils of transformer 38 ensure that a high impedance is presented to voice band signals by the "switched mode constant DC current source." However, Carter does not disclose the efficiency of the DC current source.

Official Notice is taken of the fact that perfect efficiency is an ideal property of all power converters. Namely, a converter that can generate an output voltage with no waste is ideal. In any case, designing for high efficiency, to the extent of what is achievable, is always an obvious goal. For example, the applicant admits as prior art a Texas Instrument model TPS5102 converter that achieves 85-90% efficiency. Further, designing for high efficiency is obvious because the applicant's specification does not indicate how such a high efficiency is achieved, the specification can only be considered

enabling if designing for such a goal itself were achievable to one of ordinary skill in the art at the time of the invention.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the converter of Carter in a manner well-known in the prior art to operate with an efficiency of 85-90% for the purpose of reducing waste energy.

Returning to the issue of telephone device resistance Official Notice is taken of the fact that the EIA-470 standard sets forth that telephones have a resistance between 100 and 400 Ohms. Compliance with any telecommunication standard by a telephone device, such as device 14 of Carter, is at the essence of obviousness. To wit, complying with rules in order to make work is always motivating.

Therefore, it would have been obvious to ensure that the telephone device of Carter complies with the EIA-470 standard for the purpose of enabling the use of the telephone device with an EIA-470 network.

3. Claims 2-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carter et al. (US Patent 5,138,658) in view of Boudreaux, Jr. (US Patent 6,668,060).

Claim 2 is limited to "the subscriber loop interface circuit according to claim 1," as covered by Carter. The switched-mode constant DC current source of Carter is, in terms of terminal behavior, a switched-mode voltage-to-current transconverter. So it cannot be said that it is a "switched-mode current boost converter." However, the claim broadly states that the current source comprises, or includes, such a converter. This limitation will be shown below to be obvious.

In particular, the negative rail $-V$ composing part of the current source of Carter is not described in detail, suggesting prima facie to one of ordinary skill in the art to use any known power supply to generate the voltage on said rail. Boudreaux teaches an exemplary prior art power supply for a negative voltage rail in a SLIC. In addition to the prima facie requirement of simply selecting a power supply, the supply of Boudreaux advantageously increases efficiency of battery consumption by tracking the voltage on the tip and ring lines feeding the subscriber's telephone device. See Abstract as well as figures 2 and 3.

It would have been obvious to one of ordinary skill in the art at the time of the invention to embody the $-V$ voltage rail using the switched-mode current boost converter of Boudreaux for the purpose of enabling one to instantiate the invention of Carter and because the power supply of Boudreaux increases battery consumption efficiency.

Claim 3 is limited to "the subscriber loop interface circuit according to claim 2," as covered by Carter in view of Boudreaux. As seen in figure 3, Boudreaux includes a *first semiconductor switch* (150) and a *second semiconductor switch* (164). Analysis of the circuitry indicates that when the *first switch* (150) is conductive, a negative potential is present at the anode of the *second switch* (164), causing reverse bias and placing the second switch into a cut-off (i.e. *open*) mode. This corresponds to the *second state*. When the *first switch* (150) is not conducting current, the ground is used to sink current that is sourced by the output inductor (160). This corresponds to the *first state*. Therefore, Carter in view of Boudreaux makes obvious all limitations of the claim.

Claim 4 is limited to “the subscriber loop interface circuit according to claim 3,” as covered by Carter in view of Boudreaux. Figure 3 depicts a capacitor (162) whose position clearly indicates that it charges during the first state because of the bias supplied by the –48V battery. Thus, it must discharge during the second state as transistor (150) conducts. Therefore, Carter in view of Boudreaux makes obvious all limitations of the claim.

Claim 5 is limited to “the subscriber loop interface circuit according to claim 4,” as covered by Anderson in view of Boudreaux. Figure 3 also depicts an output inductor comprising elements (160) and (132). Clearly, as the output is DC, voice signals that may leak onto the output line will meet a high-impedance. With respect to limiting output current ripple to less than about one percent, there is no disclosure within Boudreaux pertaining to the amount of high-frequency switch-mode ripple the output inductors remove.

It has been found that changes in size/proportion that do not effect the overall operation of the art to be obvious; see *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); and *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984). Because the impedance of an inductor can be related by the equation $z = j\omega L$, it is clear that the result of increasing the size of an output inductor is reduction in ripple. The instant claim suggests scaling the output inductor to reduce ripple to less than about one percent, while the prior art only indicates selecting a suitable scaling to generate DC. It follows that the only

difference that can be construed between the instant claim and the prior art is one relating to a change in size/proportion, whose result merely reduces ripple at the output of the circuit, while the function of the circuit is essentially the same. Therefore, Carter in view of Boudreaux makes obvious all limitations of the claim.

Claim 6 is limited to "the subscriber loop interface circuit according to claim 5," as covered by Carter in view of Boudreaux. As seen in figure 3, the *first switch* (150) is really a *CMOS transistor*. It receives an input from operational amplifier (100) that acts as a comparator to selectively activate the transistor (150) according to the dynamic and time-varying voltage state of the tip and ring lines (20); see column 4, line 58 through column 5, line 2. Therefore, Carter in view of Boudreaux makes obvious all limitations of the claim.

Claim 7 is limited to "the subscriber loop interface circuit according to claim 6," as covered by Carter in view of Boudreaux. As seen in figure 3, the *second switch* (164) is really a *fast-response diode*. As explained in the rejection of claim 2, it operates in an alternate fashion to *the first switch*, which was shown in the rejection of claim 6 to be controlled by a *dynamically time varied input signal*. Therefore, Carter in view of Boudreaux makes obvious all limitations of the claim.

4. 13-17 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boudreaux, Jr. (US Patent 6,668,060) in view of Anderson et al. (US Patent 6,728,370).

Claims 13-17 and 23 are rejected for the same reasons presented in the Final Office Action filed 26 June 2006.

Response to Arguments

Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments with respect to claims 13-17 and 23 have been considered but are unpersuasive.

Regarding claim 13, the applicant alleges on page 12, lines 18-20, of the current response that claim 13 requires a "constant DC current feed," stating such a feature is not disclosed in the references. The examiner respectfully disagrees: Boudreaux refers to using the output of the switched-mode current boost converter including battery 52, transistor 41, inductor 60 and PWM circuit 10 to power a SLIC comprising a current source. As disclosed in column 2, lines 47-49, the SLIC is programmed to a specific DC loop current set point. This means the DC current output is set, i.e. is constant.

Regarding claim 13, the applicant further alleges on page 13, lines 7-13, that the system of Boudreaux may not achieve the 85-90% efficiency of the invention. However, this is not claimed and is moot.

The remaining arguments concerning claims 13-17 and 23 appear to be mere allegation failing to comply with 37 CFR 1.111(b).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F. Briney III whose telephone number is 571-272-7513. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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SUPERVISORY PATENT EXAMINER

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